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2.\*\*\*\* shows the word-which can not be translated, 3.In the drawings, any words are not translated.

### 57) [Claim(s)] SMINS

CH2CH2CH2CH2O-, (b) A bisphenol A type epoxy resin, a silane coupling agent which contains an amino Claim 1](a) A polymer whose substantial repeating unit it has a reactive silicon group and is -

group and alkoxy silyl groups in one molecule (o), (d) A hardenability resin composite which consists of an spoxy resin hardener which is a silanol condensation catalyst which is a tin compound containing ctravalent tin and the (e) third class amine compound, or its salt

Claim 2](a) The hardenability resin composite according to claim 1, wherein a main chain of a polymer of an ingredient is polyether obtained from a tetrahydrofuran by ring opening polymerization, or polyether obtained from a tetrahydrofuran and cyclic ether by ring opening polymerization. [Claim 3](b) The hardenability resin composite secording to olaim 1 or 2, wharein an ingredient is an

Claim 4](c) A hardenability resin composite given in any 1 clause of Claims 1-3 to which a blending ratio of apichlorohydrin bisphenol A type epoxy resin obtained from bisphenol A and epichlorohydrin.

Claim 5](d) A hardenability resin composite given in any 1 clause of Claims 1-4 to which a blending ratio of [Claim 6](e) A hardenability resin composite given in any 1 clause of Claims 1–5 to which a blending ratio of a silane coupling agent of an ingredient is characterized by being 0.01 - 50 weight section to (a) ingredient a silanol condensation catalyst of an ingredient is characterized by being 0.01 - 20 weight section to (a) an epoxy resin hardener of an ingredient is characterized by being 0.01 - 300 weight section to (b) ngredient 100 weight section. 00 weight section.

[Claim 7]A control method of phase structure of a hardened material facing controlling phase structure of a sardened material produced by making harden the hardenability resin composite according to claim 1, and Claim 8](o) A method of carrying out 0.01-50 weight-section addition of the silane coupling agent of an ngredient to polymer 100 weight section of the (a) ingredient according to claim 7. changing an addition of a silane coupling agent. ngredient 100 weight section.

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### DETAILED DESCRIPTION

## Detailed Description of the Invention

nardenability resin composite excellent in the adhesive property by which the phase separation structure industrial Application. This invention relates to a hardenability resin composite, it is related with the produced in more detail in the process to harden was controlled.

atom content group containing the silicon atom which the hydroxyl group or the hydrolytic basis combined, Description of the Prior Art]Since the polymer which has a reactive silicon group (basis which is a silicon and can form a siloxane bond) carries out bridge construction hardening under moisture existence, it oan

use as a hardenability resin composite. Generally that in which the principal chain skeleton is polyether in hese polymer is known as modified silicons, and is widely used for the sealing agent etc.

of the mixture with the hardening resin hardened by a different hardening reaction from this can be carried but, and it can turn into a hardened material in which various phase structure is shown. As such a mixture, or an epoxy resin. The hardened material obtained from these constituents becomes the thing excellent in be stored under sealing and it is suitably used as 2 liquid system achesives in which moderate elasticity is shown (JP61-83220A, JP,61-241723A, JP,62-84134A, JP,63-3012A). The phase structure of the (0003) t dissolves with the polymer which has a reactive silicon group, and by hardening, phase separation there is a constituent with the polymer which has a reactive silicon group, this, the dissolving phenol resin, intensity or toughness as compared with what stiffened each resin independently. These constituents can nardened reactive silloon group is made into a matrix, and the hardened opoxy resin has structure (domain nardened material obtained from the constituent of the polypropylene oxide which has a reactive silicon structure of a ball/matrix) distributed in the domain of 0.05-0.5 micrometer in diameter particle state. thought that this is based on the reinforcing effect of the epoxy resin hardened to particle state (the Although this hardened material shows high elongation after fracture and high breaking strength, it is group, and a bisphenol A type epoxy resin in these, Usually, the polypropylene oxide which has the Society of Polymer Science, Japan proceedings, 36 No. 2, 394 pages).

ochesive force is small when the polypropylene oxide which has a reactive silicon group serves as a matrix, still bigger bond strength, especially tensile shear strength may be needed. In order to raise intensity and consists of the polymer and this which have a reactive silicon group, and a dissolving epoxy resin, the schesive force of a matrix influences the physical properties of a hardened material greatly. Since the Problem to be solved by the invention In the hardened material obtained from the constituent which coughness further by the curing system which consists of this constituent, while lowering the particle liameter of an epoxy resin and heightening a reinforcing effect, what the amount of epoxy resins in a nstrix is made to increase, and the cohesive force of a matrix is raised for (the phase structure of a

which has a reactive silicon group, and an epoxy resin, phase structure control of a hardened material is 0005]However, generally in the curing system acquired from the constituent of the polypropylene oxide difficult, it cannot be considered as the above phase structure considered to raise physical properties, such as an alastic modulus and tensile shear atrength, further, and to get by addition of change of the composition ratio of a constituent, a silane coupling agent, etc. although a certain amount of control is nardened material is controlled) can be considered.

he purpose is to provide the hardenebility resin composite which can control the phase structure of \*\*, to 0008]This invention is made in view of the above-mentioned fact, and is a thing.

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P,3156162,B [DETAILED DESCRIPTION]

changed substantially and in which especially an elastic modulus and tensile shear strength have been which the particle diameter of a distributed epoxy resin particle and the intensity of a matrix can be mproved.

Mesns for solving problem]The phase structure of a hardened material obtained from a constituent which consider being influenced by addition etc. of both compatibility, a oure rate, and a specific compound that 0008]Inventors found out that a thing containing repeating unit-OH2CH2CH2CH2O- was excellent in consists of a polymer and this which have a reactive silicon group, and a dissolving cpoxy resin oan can react with both, i.e., a silane coupling agent.

material of high tension shear strength at a rate of high elasticity, and resulted in this invention. [9009]Namely, a hardenability resin composite of this invention has the (a) reactive silicon group. A polymer whose substantial repeating unit is -OH2CH2CH2CH2O-, (b) It consists of an epoxy resin hardener which is especially compatibility with an epoxy resin in a polymer which has a reactive silicon group. In a constituent which blended this polymer, a dissolving epoxy resin, a condensation catalyst, an epoxy resin hardener, and a silane coupling agent, Phase structure of a hardened material changed especially with addition of a silane groups in one molecule (c), a silanol condensation catalyst which is the tin compounds containing tin of (d) coupling agent substantially, while particle diameter of an epoxy resin particle distributed in a hardened s bisphanol A type epoxy resin, a silane coupling agent which contains an amino group and alkoxy sily naterial fell, the amount of epoxy resins in a matrix increased, and it found out becoming a hardened 0010]Especially in this hardenability resin composite, phase structure of a herdened material can be etravalence and the (a) third class amine compound, or its salt.

changed. As a result, a hardened material of high tension shear strength can also be obtained at a rate of nigh elasticity which raised cohesive force of not only a hardened material of high elongation but a matrix [0011]Although a principal chain skeleton of a polymer of the (a) ingredient contained in this invention is controlled by a kind and an addition of a silane coupling agent, and coheaive force of a matrix can be generally obtained by ring opening polymerization of a tetrahydrofuran, A tetrahydrofuran, and with the conventional low clastic modulus.

[0012](a) Although a reactiva silicon group in particular contained in an ingradient is not limited, if a typical /alerolactone, and epsilon-caprolactone, a succinic anhydride, and phthalic anhydride, may be carried out. Two or more sorts of these copolymerizable monomers may be used together. A polymer obtained from a sthylencoxide, propylene oxide. Copolymerization of the acid anhydrides, such as lactone, such as cyclic etrahydrofuran and a copolymerizable monomer may be a random copolymer, a block copolymer, a graft. sther, such as alkylene oxide like allyl glycidyl ether, oxetane, and oxepane, beta propiolactone, deltacopolymer, or an alternating copolymer, and may be such mixed structures. It may be a mixture of a solymer in which auch structures differ.

thing is shown, a following general formula and a basis expressed with \*\* 1 will be mentioned, for example. [Chemical formula 1]

numbers 6-20, When the Tori ORGANO siloxy group shown by an aralkyl group of the carbon numbers 7-20 or (R) <sub>3</sub>SiO- is shown and R<sup>1</sup> or two or more R<sup>2</sup> exist, they may be the same and may differ. R' is a univalent hydrocarbon group of the carbon numbers 1-20 here, and three R may be the same and may inflirer. X shows a phytroxyl group or a hydrolytob should be a hydrolytob should be a hydrolytob should be a hydrolytob should be a sent and may differ, A short a, 0, 1, 2, or 36 shows 0, 1, or 2, respectively, no process [0014]. R<sup>1</sup> and R<sup>2</sup> among [type, All An alkyl group of the carbon numbers 1-20, an aryl group of the carbon Chemioal formula 2] http://www4.ipdl.inpit.go.jp/ogi-bln/tran\_web\_cgi\_ejje?atw\_u=http%3A%2F%2Fwww4.ipdl.inpit.go... 2010/10/22

b which can be boiled and set may differ, m shows the integer of 0−19. However, a+sigma b>=1 shall ba satisfied. The hydrolytic basis in particular shown by the shove X is not limited, but should just be a

ithough a hydrogen atom, an alkoxy group, an acyloxy group, a KETOKISHI mate group, an amino group, an (a+sigmab), it is preferred that it is 1-5. When a hydrolytic basis and a hydroxyl group combine with the two amide group, an aminooxy group, a suifhydryl group, and an alkenyloxy group are preferred, the viewpoint of 0015]1-3 of of this hydrolytic basis and hydroxyl group can be combined with one silicon atom, and, as for in aminooxy group, a sulfhydryl group, an alkenyloxy group, etc. are mentioned, for example. Among these, group, an acyloxy group, a KETOKISHI mate group, an amino group, an amide group, an acid-amide group, 0016]Although there may be one silloon atom and there may be two or more pieces in a reactive silicon conventionally publicly known hydrolytic basis. Specifically, a hydrogen atom, a halogen atom, an alkoxy ydrolysis nature being quiet and being easy to deal with it to especially an alkoxy group is preferred. or more same silicon atoms, they may be the same and may differ.

moup, in the case of a reactive silicon group with which a silicon atom was connected by siloxane bond sto., there may be about 20 pieces.

(0017)a reactive allicon group expressed with a following general formula and \*\* 3 -- acquisition -- from an easy point, it is desirable.

Chemical formula 3]

R3-8 Si-Xa

mentioned general formula and \*\* 1, and R<sup>2</sup>, For example, cycloalkyl groups, such as alkyl groups, such as a phenyl group, and benzyl, the Tori ORGANO siloxy group R is indicated to be by 3SiO- which is a methyl methyl group and an ethyl group, and a cyclohexyl group, Aralkyl groups, such as anyl groups, such as a R<sup>2</sup>. X, and a are the same as the above among a formula.) Again as an example of R<sup>1</sup> in the above-

0019] A reactive silicon group is good for 1.1-5 pieces to exist preferably in [ at least one ] one molecule of polymers. Since hardenability bacomes insufficient, and the network atructure will become too much group, a phenyl group, etc. (R), etc. are mentioned. Especially as R<sup>1</sup>, R<sup>2</sup>, and R<sup>1</sup>, a methyl group is

0020]A reactive silicon group may exist in the end of a polymer chain, and may exist in an inside, or may nardened material formed eventually increases when a reactive silicon group exists in the end of a chain sxist in both. Since the effective network chain density of the polymer component contained in the troups contained in one molecule of polymers will be less than one piece.

iense if too large, it stops showing a good mechanical characteristic, if the number of reactive silicon

especially, it is desirable from points, like the hardened material excellent in the mechanical property secomes is easy to be obtained.

(1002)As an example of an ingredient (a) *Lit Fd*-3631B, UP 44-12154B, UPS9-15609A, UPS4-6098A, UPS4-6098A, UPS4-6098A, UPS4-6098A, UPS4-6098A, UPS4-6098A, UPS9-6098A, UPS9-6 0021](a) An ingredient may be straight chain shape, or it may have branching and the molecular weight is ,000-20,000 more preferably 500 to about 50,000. 0023]As an epoxy resin of the (b) ingredient contained in this invention, Epichlorohydrin bisphenol A type

novolak-type-epoxy-resin; — hydroganation bisphenol A type apoxy resin; — the głycidyl ether type epoxy resin of a bisphenol A type propylene oxide addition. Głycidyl ether type epoxy resine, such as a bisphenol 4 type cthylene oxide addition; Diglycidyl p-oxybenzole acid, Phthalic acid diglycidyl ester, tetrahydrophtal epoxy resin. Epichlorohydrin bisphenol-F-type-epoxy-resin, Epichlorohydrin bisphenol smooth S form epoxy resin, fire retardancy type epoxy resin [, such as głycidy] ether of tetrabromobisphenol A. ].—

P.3156162,B [DETAILED DESCRIPTION]

hing limited to these but the epoxy resin currently generally used can be used. What contains two or more epoxy groups among these epoxy resins tends to form the network structure, and is preferred. The point of compatbility with the (a) ingredient to the epoxy resin which has glycidyl ether more preferably, especially acid diglycidyl ester, Glycidyl ester typed epoxy resin, such as diglycidyl hexahydrophthalate and adipic acid AJIPETO, ant cyclic dispoxy carboxylate, and vinyl cyclohexane oxide, although the epoxidation thing of an and the following --- the same) of (a) ingredients, and it is 10-300 copies more preferably. Cohesive force nsufficient for it. When exceeding 900 copies, the polymer which has a reactive silicon group which is the digNoidyl aster; Triglyoidyl m-aminophenol, N.N.N.; and N'-tetragNoidyl ether diaminodiphenylmethane, N. unsaturation polymer, etc. are illustrated at the time, such as polybutadiene and petroleum resin, Not the 0024](b) as for the addition of an ingredient, 5-900 copies are preferred to 100 copies (a weight section accyanurate; -- polyalkylene glycol dighyoldyl ether, Glycerin, glycidyl ether of polyhydric alcohol like sorbitol, An ant cyclic diepoxy acetal. Cyclic sliphatic series epoxy resins, such as ant cyclic diepoxy a) ingredient is not incorporated into the matrix of a hardened material, but clasticity runs short, a and N-diglycidyl aniline, glycidyl amine-type-epoxy-resin [, such as N.N-diglycidyl o-toluidine, ]; occomes in the case of less than five copies, the toughness by an cpoxy resin is not revealed, and hydantoin type epoxy resin [, such as 1.3-diglycidyl 5-methyl-5-ethylhydantoin, ]; — triglycidyl an epichlorohydrin bisphenol A type epoxy resin are preferred. nardened material becomes weak, and it is not desirable.

content Silang which ganerally contain a hydrolytic silicon group and other functional groups in one molecule, and an amino group of the first class, the second class, and the third class, a sulfhydryl group, an ydrolytic basis is used in the above-mentioned general formula and \*\* 1 as a hydrolytic silicon group and group, etc. are mentioned as such a functional group. What has in this an amino group of the first class in which a reaction is possible, the second class, and the third class, a sulfhydryl group, an epoxy group, and aminopropyl methyl dimethoxysilane, gamma—(2-aminoethyl) aminopropyl methyldiethoxysilane, gamma—(5aninopropyl methyl dimethoxysilane, gamma-aminopropyl methyldiethoxysilane, gamma-(2-aminoethyl) aminopropyl trimethoxysilane, gamma-(2-aminoethyl) aminopropyl triethoxysilane, gamma-(2-aminoethyl) aminopentyl) aminopropyl trimethoxysilane, gamma-(5-aminopentyl) aminopropyl triethoxysilane, gammapropyltrinethoxysilane, gamma-mercaptopropyl triethoxysilane, gamma-mercaptpropylmethyl dimethoxysilane, Sulfhydryl group contant Silang, such as gamma-mercapto propylmethyl diethoxysilane, an ureido group to the both sides of the polymer which has a reactive silicon group of the (a) ingredient, and the epoxy resin of the (b) ingredient is preferred. What has an amino group of an amino group aspecially the first class, and the second class is preferred more preferably. Although that whose X is a spoxy group, an ureido group, an isocyanate group, a vinyl group, an methacrylic group, a halogeno alkyl methyldiethoxysilane, N-beta-(N-vinylbenzyl aminoethyl)-gamma-aminopropyl trimethoxysilane, Amino 0025] The silane coupling agent of the (c) ingredient contained in this invention, it is functional group being got, the ease of handling, etc. to alkoxy silyl groups is preferred. As an example of these silane coupling agents, gamma-aminopropyl trimethoxysilane, gamma-aminopropyl triethoxysilane, gamma-(5-aminopentyl) aminopropyl methyl dimethoxysilane, gamma-(5-aminopentyl) aminopropyl group content Silang, such as gamma-anilino propyltrimethoxysilane; gamma-mercapto

0026](c) As for an addition of an ingredient, 0.01–50 copies are preferred to 100 copies of (a) ingredients. Out of this range, control of effective phase structure cannot be performed, and when it is especially 0.01 or less copy, surface adhesiveness runs short and it is not desirable. They are 0.1-5 copies more and may be used together two or more sorts.

and gamma-ureido propylmethyl diethoxysilane, are raised. These sllane coupling agents may be used alone

content Silang, such as gamma-ureido propyl triethoxyailane, gamma-ureido propylmethyl dimethoxysilane,

nethyldiethoxysilane; gamma-ureido propyltrimethoxysilane, Silane compounds, such as ureido group

methyl dimethoxysilane, Epoxy group content Silang, such as beta-(3.4-epoxycyclohexyl) ethyl

ethyltrimethoxysilane, beta-(3, 4-epoxyoyolohexyl) ethyltriethoxysilane, beta-(3,4-epoxyoyolohexyl) ethyl

Gamma-giyoidoxypropyitrimatoxyailane, gamma-giyoidoxy propyitristhoxyailana, gamma-giyoidoxy propyl methyidimethoxyaslane, Gamma-giyoidoxypropylmethyidietoxysilane, beta-(3, 4-epoxycyclohexyl)

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conquous (E carb as lead occided E - a business, conductions and conduction (Land) among conductions conductions and conductions are conducted and conductions and conductions are conducted and conductions are conducted and conductions are conducted and conducted and conductions are conducted as a conducted and conducted an

compound, etc. are illustrated, Not a thing limited to these but a condensation catalyst currently generally

used as no send. These situation condensation condensation condensation was been deliced from the concentration of the concentration of

oxocede 20 copies, it is possible to have an adverse effect on an adhesive proparty cto, and is net 20029] as an eposy resin hardaner of the (o) isgradient contained in this invention. Treshydrasebramine, adversebyeaptumine, deplayment propriation. Naminedul, presents all REISEM, amine appropriated and propriate positions, m-relydene damine, m-inventional designing. This first clauses, such

as deminodekenymetrikan and dianskodernak distrike. The sound class anterial "Infolkation N-methyle is a deminodekenymetrikan and dianskodernak distrika. Tirtikladinneh N-methyle medinodeken dianskodernak diansko

inhightic, a disobelization in markefuls, Arthorica enboyale lead is called the Marketic arthorists and such as irregitic anhydric, syromellic demyndrick and anhydrous (KIDORRM acid Boron trillanchic, Abbrault because acids, and as phosphorists herallucing, trillanchic and the salts of locals, etc., and instruction, it not limited to these, and the spoxy reals instruction currently generally used and to used. These popy, varie hardones may be used almost many be used apparently used and the used. There is not limited to these, and the spoxy reals instruction currently generally used and the used. There is not instructed to the supervise and the properties of the properties of the high data are preferred from a position of the properties of the high among these soay vietals handones. The properties of (DOGIGO) What is more essensy is just to use it according to the purpose to: 100 copies of (s) hereddents in (DOGIGO).

(1000)(in White is necessary is used to care a sockwell, to the Opensia or to capacity or to the property of the Opensia or the Capacity or the method of properation of a landenbally resin composite to containing the Capacity or the Capac

containing an important, not not externed to the containing and an externed to the following the containing and an externed to the containing and the containing and the containing and the containing and important to display containing and the containing and important assistanced of mixing is adopted and it that the size operation is adopted of mixing is adopted and it that the component temporal to build and use I liquid type and a three-component temporal.

usidably the bulbs and use I chause drybe and a succomponent convolution to compatibilizer, an adheative polyculin a constituent of this investion, further if needed A debydrafor, a compatibilizer, an adheative mproving agent, Various additive agents, such as a physical-properties regulator, a preservability as tability mproving agent, bulbing agent, an artisting agent an otherwise regulator, ray absorbert, a metal describentor, and consuct, light stabilizer, unine system and said a plan in infaltor, a physiphorus system percode decemposition

igent, laricant, parits, and a forming spert, can be added aulabib.

10 0331/hmur units a bulke speet as an additive agent, for example, used four, wature shell rounder, chaff

10 0331/hmur units a bulke speet as an additive agent, for example, used four, wature shell conder, chaff

10 0331/hmur units a bulke speet and an additive agent, for example, tooling a shell continue are used and it gets a speet addition and probrets, magnitum ordobus an abundhum records an abundhum and a abundhum ordobus and abundhum and a abundhum ordobus and abundhum and a abundhum ordobus and abundhum and a abundhum a abundhum and a abundhum and

re used and it set in a side side, claim enforceste rangealism entrotheris chaimle robbe an alternium obliga and entrope control obligation obligation obligation obligation obligation of the obligation of the obligation of the obligation of order or order.

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(1093) Once phormes which was a restorbe index group out them a polymer of the (i) ingredient for commonly, exclosible index and the control of the commonly exclosible index of the commonly of the common

Working exampled. This invention is equalized still none convented betack on an excludement. 200 g. of problementations propic of the example of financial Inventory value 215 dates the overage motionity resignt 4.11 one pot into 1-1 actorious, Africa adding 4.65 g. of CH<sub>2</sub>ONa288 methanol solution and example, and decomprised originality in 10.98 for the host of loss as 2.45 mill oblinicis was despeted and example, and decomprised origination is 10.98 for the host of loss as 2.45 mill oblinicis and despete and example and the solution of the solution of the solution of the propaga are introduced into 350 of whose after by before value assurements. After parties 200 g. in his lift of their propher another host of coping method directly life. (Directly Adding the 10% others sold life or decir in a 500-mill amount.) HANIRA measurement [5007].

CH30) 281 CH2 CH2 CH20-

Chemical formula 4]

It was checked that polybetranethylene oxide of the average molecular weight 4,400 [about ] which has 1.6 at the tetrahyper molecule has been acceptanced to the example of minutheture 2 hydroxyl

value 28.0, the servage noticular weight 4.007, and 10 weight % of prosylents cooled contents. By the same mentod as the cannel of intransferour. The starblydeforum propylents colorid contents weight 4.500 (about) which has 1.0 starbchives per molecular weight 4.500 (about) which has 1.0 starbchives per molecular expressed with an end by the above-zeroin of was obtained.

The severge molecular weight which introduced the example of manufacture 3 ally other and into 90% of

whele and are are the tribulacionar propolation and ending and are also and a set of the area and are also are al

estructures per modeule abovedade with an end by the above-frazion 4 by the same method as the counnel to formunidates was obtained. Prove a consistent and the person of the country of

polytetramethylene oxide triblock copolymer of the average molecular weight 4,100 [ about ] which has 1.6

Publichramethylene order of the surenge molecular weight 4400 which has the neather allocal mount of the factor of the surenge of 24 mount of the surenge of 25 mount of

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[Table 1]

S	Þ Mæri	ε	12	T T MH	0T ¥¥	6	8	L Mil	9 17#	S	z HWH	Þ	8	Z 361	τ	T.		
-			-		-	_	100	100	100	0 O T	001	100	00T	001	100	100	TOSTINA	#42
-	-	-	-	-	-	COT	-	-	-	-	-	-	-	-	-	-	\$5#MS	会表珠トー
-	-	-	-	-	DOT	-	-	-	_	_	-	-	_	_	_	-	EMEN	9.41
-	_	_	-	001	_	_	-	_	_	_	1 -	-	_	-	_	-	SIAWAY PIGERY	***
101	100	001	- 001	-	-	-	-	-		-	-	- '	-	-	-	-	916831	
2	05	0 ⊆	os	0 ⊆	09	0 ⊆	001	001	100	0 O T	100	0 S	05	05	05	os	828#	114<+h-
:	τ	-	2	t	2	2	8.1	S	3	τ	-	9.1	s	z	τ	-	-	
	τ	ī	τ	τ	τ	ī	τ	τ	t	τ	τ	τ	ŧ	1	τ	τ	-	W-16
-	s	s	s	S	<u>s</u>	5	οt	10	0 1	0 τ	10	s	s	s	s	s	MP 3 C	

A tetrahydrofuran propylene oxide random copolymer of the average molecular weight 4,300 [ about ] which oopies and the silane coupling agent A1122 were carried out for epoxy resin Epicoat #828, one copy and has the reactive silicon group obtained in the example 2 of embodiment 9 manufacture 100 copies, 50 live copies of epoxy resin curing catalyst DMP30 were mixed for two copies and silanol condensation

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# P.3156162.B [DETAILED DESCRIPTION]

he hardenability resin composite was obtained like Embodiment 9 except having used the tetrahydrofuran he hardenability resin composite was obtained like Embodiment 9 except having used the tetrahydrofuran propylene oxide random copolymar of tha avarage molecular weight 6,800 [ about ] which has the reactive catalyst #918 like Embodiment 2, and a hardenability resin composite was obtained alloon group obtained in the example 3 of embodiment 10 manufacture.

propylene oxide random copolymer of the average molecular weight 8,400 [ about ] which has the reactive

average molecular weight 4,100 [ about ] which has the reactive silicon group obtained in the example 5 of polytetramethylene \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* propylene oxide polytetramethylene oxide triblock copolymer of the The hardenability resin composite was obtained like Embodiment 9 except having used the silicon group obtained in the example 4 of embodiment 11 manufacture. embodiment 12 manufacture.

agent A1122, and silanol condensation catalyst #918 and epoxy resin curing catalyst DMP30 were mixed by Polypropylene oxide of the average molecular weight 5,200 which has the reactive silicon group obtained in the comparative example 3 - the example 6 of 5 manufactures, Epoxy resin Epicoat #828, silane coupling he presentation (weight section) shown in Table 1, and the hardenability resin composite was obtained. 1) The dumbbell tensile test above-mentioned hardonability resin composite was slushed into the mold 0039]The following examinations estimated the above-mentioned hardenability resin composite.

ahaped hardened material, At the time of 30% tension, at the time of 50% tension, it was extended at the time of each modulus at the time of 100% tension (M<sub>39</sub>, M<sub>50</sub>, M<sub>100</sub>), breaking strength (TB), and a fracture, made from Teflon, it was recuperated at 50 \*\* at 23 \*\* on the 4th on the 3rd, and the sheet-shaped hardened material was obtained. Based on JIS K6301, the No. 3 type dumibbell is pierced from this sheetand (EB) was measured by speed-of-testing 200 mm/min.

the aluminum plate (100mmx25mmx2mm A-1050P aluminum plate specified to JISH 4000) was lightly wiped 0040]The result of the above-mentioned examination and measurement was shown in Table 2 and Table 3. about 25 mm x 12,5 mm) at about 0.05 mm in thickness with the spatula. Then, the spreading sides of the preaking the value obtained by measuring maximum load until the hardened material portion of a specimen 2) Measurement based on tensile shear strength measurement JIS K 6850 was performed. The surface of cogether, and it was stuck by pressure by hand. The adhesion side of this specimen was fixed and it was with acetone, and the above-mentioned hardenability resin composite was applied to the range of a size sluminum plate with which the above-mentioned hardenability resin composite was applied were pasted recuperated at 50 \*\* at 23 \*\* on the 4th on the 3rd. Then, it asked for the tensile shear strength by s destroyed by speed-of-testing 5 mm/min by a coated area.

Table 2

	レッカンカップ			ダンベル引送物性	1张物性		せん断弦突
		M30 (	M50 kg (/e	M50 M100 (kg f / cm <sup>3</sup> )	T B (kgf/cm²)	E B (%)	(kgf/cm²)
JE6591	0	3.5	4.6	8. 1	107	515	61.9
兴趣到1	м	10.4	15.9	31. 6	81.9	224	98. 7
完施到2	61	21. 9	32. 7	59. 6	90. 5	158	147
先经的3	5						142
実體例4	7. 5						143
HEEF 2		10. 4	10. 4 16. 0 32.	32. 3	128	310	51.7
REMEMB	1	34. 6	50.2		67. 5	7.3	115
38896	C)	86.9	114	,	116	51	165
7年第3年	īv						128
SCHEP18	7. 5						116
HRW3	٥		e,	rų 4	37. 4	460	21. 1
EMEN4	-		7. 1	13. 6	62. 5	290	93.8
HRENS	2		10, 7	21. 2	68. 2	250	100

### 042] able 3]

世人斯特敦	(k@f/cm²)	147 180 100 143	100
	<u>"</u> §	158 125 180 314	250
ダンベル引突物性	T B (kgf/cm <sup>1</sup> )	90. 5 77. 7 74. 4 11.2 12.1	68. 2
6	M50 M100 (kgf/em²)	32, 7 59, 6 36, 9 64, 4 27, 4 46, 3 24, 9 41, 8 37, 9 67, 1	松崎6 10.7 21.2
の事		MARSON 1 MARSON 3 MARSON 3 MARSON 3 MARSON 3 MARSON 3 MARSON 3	200 miles
		英雄術2	LEEBN 5

3) After it used as the frozen ultra thin section the hardward material obtained by the transmission electron infrarences observation shower-transitioned scannishts and and entire object it transmission electron inforescept observation was parformed with the acceleration relates of 120 kV using the transmission electron inforescept described. Co., Lift unker, 140-12000PA.

[Odd/III] consumative examilia I was alrown in Embodiment 9 and described, and the transmission electron inforescept observation plotograph of the comparative examilia I was alrown in Embodiment 9 and described, and the transmission observation plotograph of the comparative examilie 4 was alrown in described. It is experient.

rttp://www4.ipdlinpit.go.jp/ogi-bin/tran\_web.ogi.ejje?atw\_u=http%3A%2F%2Fwww4.ipdlinpit.go... 2010/10/22

(Oct-QWind the brassle short extrengt is higher than it can store a comparative committe in the monodement of this invention so that more clearly than IT allet, 2, he modulus of the hardened material changes is a few that the recenses in the addition of a siles output graph.

Octobally a brashess of material of the constituent using the various polymers of the 6) ingredient contained in this invention is a high modulus from it of a comparative example so that more clearly than IT able 6. [DidDigh the transmission detaction indexespons observation into see Elebodiums 2 cleven is desiring i. Concerned with the thirt of its compensative namels 1 shown in admired. But particle dismans of the particle state dominimonisms of the compensative namels 1 shown in admired in your but not made becomes and, And it is suggested that the volume ratio of a domini and a matrix in mailer than the composition ratio. (Not) of the george with a final particle is the properties of the properties of the particle is a manual particle of the particle is a simple than the composition matrix of an emploherine ratio as a final particle is possible particle in the set for instant that has demonstrated and matrix of an emploherine ratio set as a set and a set of the properties of the particle of particles. The particle is a set of the particle is a set of the particle of designative counties of this to be observed by the thing using the various polymers of the foll improduct contains in this inventor.

[Effect of the horeinchiological post his removal countries are selected as explaint in the administor processor, is provided. The hardened material of the rate of riting exactly wished material to the control and administor of the processor. It is provided. The hardened material of high description but the native with the law elastic modulus, and high tention has a transpir on the beduined by controlling the addition of a aliane coupling agent.

Because the administrative and the processor of the invention can be used to the dynamic characteristic demanded as the administrative which our respons a assulant, and binder by the easy means referred to as channel the addition of a silent coupling agent.

[Translation done,]

ジーマニ

\* NOTICES \*

JPO end INPIT are not responsible for any damages caused by the use of this translation.

. This document has been transleted by computer. So the transletion may not reflect the original precisely.

2.\*\*\* shows the word which can not be translated.

3.1n the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

structure of the hardened material obtained from the constituent of Embodiment 2 of this invention. [Designize Dis a transmission electron increased becaused nybotogon which shows the phese structure of the hardened material electrined from the constituent of Embodiment 9 of this invention. [Desaging 3]It is a transmission electron microacope observation priorizoraph which shows the phase [Brief Description of the Drawings] [<u>Drawing 1]</u>It is a transmission electron microscope observation photograph which showe the phase structure of the hardened meterial obtained from the constituent of the comparative example 1. Dirawing affile is transmission return inference observation intertegrate which shows the phese structure of the hardened material obtained from the constituent of the comparative example 4.

[Transletion done.]

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### 最終官に継く

### (54) [発明の名称] 硬化性樹脂組成物

(57)【特許請求の範囲】

1 [請求項1] (a) 反応性ケイ素基を有し、実質的な繰 り返し単位が

- -CH2 CH2 CH2 CH2 O-
- である重合体、
- (h) ピスフェノールA型エポキシ樹脂。
- (c) 1分子中にアミノ基とアルコキシシリル基を含有 するシランカップリング剤、
- (d) 4 価のスズを含有するスズ化合物であるシラノー ル縮合胂煤 及び
- (e) 三級アミン化合物またはその塩であるエポキシ樹 脂硬化剂
- よりなる硬化性樹脂組成物。

「請求項2】(a)成分の重合体の主鎖が、テトラヒド ロフランから閉環重合により得られるポリエーテル、あ

るいはテトラヒドロフランと環状エーテルとから開環重 合により得られるポリエーテルであることを特徴とする 請求項1記載の硬化性樹脂組成物。

「請求項3] (b) 成分が、ビスフェノールAとエピク ロルヒドリンより得られるエピクロルヒドリンーピスフ ェノールA型エポキシ樹脂であることを特徴とする請求 項1又は2記載の硬化性樹脂組成物。

【請求項4】(c)成分のシランカップリング剤の配合 割合が (a) 成分100重量部に対して0.01~5 10 0重量部であることを特徴とする請求項1~3のいずれ

か1項に記載の硬化性樹脂組成物。 【請求項5】(d)成分のシラノール縮合触媒の配合割 合が、(a)成分100重量部に対して0.01~20 重量部であることを特徴とする請求項1~4のいずれか 1項に記載の硬化性樹脂組成物。